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Nos. 07-588, 07-589 & 07-597 (Consolidated)

In The
Supreme Court of the United States

ENTERGY CORP., *Petitioner,*

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents.

PSEG FOSSIL LLC AND PSEG NUCLEAR LLC,
Petitioners,

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

UTILITY WATER ACT GROUP, *Petitioner,*

v.

RIVERKEEPER, INC., ET AL., *Respondents.*

On Writ Of Certiorari To The United States Court Of Appeals For The Second Circuit

BRIEF OF *AMICUS CURIAE* OMB WATCH IN SUPPORT OF RESPONDENTS

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TABLE OF CONTENTS

TABLE OF AUTHORITIES iv

INTEREST OF AMICUS CURIAE 1

SUMMARY OF ARGUMENT 1

ARGUMENT 4

I. FORMAL CBA, LIKE EPA RELIED ON HERE, IS NOT "COMMON SENSE"; IT IS A SPECIFIC AND CONTROVERSIAL DECISION PROCEDURE THAT CONGRESS PROHIBITED IN THE CWA. 4

II. WHEN THE CWA WAS PASSED, LAWMAKERS WERE HIGHLY SKEPTICAL OF FORMAL CBA 5

A. Congress Eschewed Formal CBA in Every Federal Environmental Statute Passed in the Early 1970s. 6

B. In Most Environmental Statutes, Congress Directed Agencies to Employ Technology-based Standards, Rather than Formal CBA or Limited Cost-Benefit Balancing 9

C. In the Few Instances when Congress did Authorize Cost-Benefit Balancing, It Intended a Limited Qualitative Balancing, Not Formal CBA 10

D. No Consensus Favors Formal CBA; It has Always been Highly Controversial. 12

III. CONGRESS ESCHEWED FORMAL CBA FOR GOOD REASON: IT PRODUCES UNRELIABLE AND IRRATIONAL RESULTS 14

A. The Data and Scientific Understandings Necessary to Quantify Many Environmental and Health Benefits are Simply Unavailable 16

1. The CBA of the Phase II Rule was Grossly Incomplete Because EPA did not even Quantify the Vast Majority of the Benefits 16

2. Even for those Benefits EPA did Attempt to Quantify, the Estimate was Grossly Incomplete. 18

B. Techniques for Assigning Monetary Values to Non-Market Goods are Unreliable and Highly Contestable 21

1. The CBA for the Phase II Rule was Grossly Incomplete Because EPA was Unable to Find Non-Controversial Methods for Monetizing Non-Market Goods 22

a) EPA Used a Method for Estimating the Benefits of Increased Forage Species Survival that Measured "Only a Small Share of these Losses." 24

b) Although EPA Believed that "Non-Use Benefits may be Significant," It Ultimately Assigned them a Value of Zero. 25

C. EPA'S Estimate of Benefits for the Phase II Rule was Grossly Incomplete, Making Any Comparison with Costs Irrational and Misleading..... 27

1. OIRA Pressured EPA into Weakening its Proposed Rule on the Basis of the Highly Flawed, Incomplete, and Irrational Results of its CBA. 28

2. Although EPA Cited Its Formal CBA as the Basis for Rejecting the Closed Cycle Alternative, the Proposed Rule Preamble went on to Cite Dozens of Reasons the Benefits were Under-Estimated. 31

3. The Phase II Rulemaking Illustrates How CBA Undermines Rational Agency Decisionmaking. 33

CONCLUSION 35

TABLE OF AUTHORITIES

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American Textile Mfrs. Inst. Inc. v. Donovan, 452 U.S. 490 (1981) 6, 8
Ass'n of Pacific Fisheries v. EPA, 615 F.2d 794 (9th Cir. 1980) 10, 12
BASF Wyandotte Corp. v. Costle, 598 F.2d 637 (1st Cir. 1979) 11
EPA v. California, 426 U.S. 200 (1976) 9, 10
EPA v. Nat'l Crushed Stone Ass'n, 449 U.S. 64 (1980) 11
Indus. Union Dep't v. Am. Petroleum Inst., 448 U.S. 607 (1980) 7
Tenn. Valley Auth. v. Hill, 437 U.S. 153 (1978) 6
Weyerhaeuser v. Costle, 590 F.2d 1011 (D.C.Cir. 1978) 10, 11, 12
Whitman v. American Trucking Ass'ns, 531 U.S. 457 (2001) 6, 8

LEGISLATIVE MATERIALS

Clean Water Act, 33 U.S.C. § 1311(b)(1)(A) 11
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33 U.S.C. § 1314(b)(2) 9
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OMB, *Circular A-4* (Sept. 17, 2003) 14

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Elizabeth Anderson, *Value in Ethics and Economics* (1993) 5
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INTEREST OF AMICUS CURIAE

OMB Watch is a nonprofit research and advocacy organization dedicated to promoting government accountability, citizen participation in public policy decisions, and the use of fiscal and regulatory policy to serve the public interest. OMB Watch was founded in 1983 to shed light on the activities and operations of the Office of Management and Budget (OMB). The organization also focuses on the substantive areas that OMB and an agency within it, the Office of Information and Regulatory Affairs (OIRA), oversee: federal regulatory policy, the federal budget, taxation and government performance, information and access, and nonprofit action, advocacy, policy and technology.[1]

SUMMARY OF ARGUMENT

In developing the Phase II rule, EPA relied in part on a formal, economic cost-benefit analysis ("formal CBA"), i.e., an analysis that estimated both the costs and benefits of the rule in monetary terms and compared them. Formal CBA is not a "common sense" tool for "rational" decision making, as petitioners contend. It is a highly controversial decision procedure that often produces irrational results. Congress was extremely skeptical of formal CBA when it passed the Clean Water Act (CWA) and thus declined to provide for it anywhere in the

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[1] The parties have consented to the filing of this brief. No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amicus curiae*, their institutions, or their counsel made a monetary contribution to its preparation or submission.

statute, including in § 316(b). Indeed, Congress eschewed formal CBA in every environmental statute it passed in the early 1970s.

Rather than directing agencies to engage in formal CBA, or even a limited cost-benefit balancing, most environmental statutes of that era, including the CWA, directed agencies to employ technology-based standards. Technology-based standard-setting requires the agency to evaluate likely costs of a proposed standard in order to determine whether it is economically feasible (i.e., "available"). But it does not require agencies to delve into the far more problematic task of attempting to quantify and monetize environmental benefits.

The technology-based approach was particularly important to Congress' overhaul of the CWA in 1972 because previous versions of that statute had required agencies to engage in a cumbersome and unworkable evaluation of water quality benefits. In those few instances when Congress did authorize cost-benefit balancing—as it did under the Best Practicable Technology standard—it did not authorize formal CBA. Rather, it directed agencies to perform a limited, qualitative balancing.

The use of formal CBA to evaluate environmental regulation has always been controversial. The practice first became widespread in 1981, when President Reagan signed an executive order requiring all major federal regulations to undergo formal CBA (to be overseen by the OMB's Office of Information and Regulatory Affairs (OIRA)). The executive order did not enjoy bipartisan support. Indeed, many viewed it as a highly partisan effort to delay and weaken regulation.

The application of formal CBA to environmental regulation rests on the untenable assumption that complex effects on ecological and human health can be quantified and expressed in dollar terms. In practice, scientific understandings are rarely fine-grained enough to predict such impacts in quantifiable terms. Even where they are, data are inevitably incomplete. And even for those data that do exist, the process of converting them into dollars raises intractable difficulties that render the results endlessly contestable.

The Phase II rulemaking illustrates these shortcomings. The formal CBA that accompanied it was hopelessly incomplete because EPA was unable to quantify the vast majority of the broad and complex ecological benefits associated with the rule. EPA admitted, for example, that its estimate accounted for less than two percent of the fish subject to impingement and entrainment from cooling water intake structures. Moreover, EPA was unable to find non-controversial methods for monetizing the non-market goods at issue. Finally, after receiving extensive criticism, EPA threw up its hands and simply left most benefits out of the analysis entirely.

The CBA never produced a reliable or meaningful number. The benefits estimate fluctuated wildly, changing by nearly a factor of ten, from $735 million under the proposed rule to $83 million under the final rule. Even the larger number was, by EPA's own frequent admission, hopelessly incomplete. The documents describing the CBA were peppered with caveats and disclaimers, describing the myriad reasons why the benefits figure grossly under-estimated the rule's true benefits.

Yet, despite the innumerable caveats, EPA still resorted to the raw numbers when it came time to

make a decision. At OIRA's urging, it rejected a closed cycle cooling alternative because "the incremental costs of this option relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." 67 Fed. Reg. 17,122, 17,158 (2002). Thus, EPA based its decision on a comparison of an incomplete estimate of benefits with a relatively complete estimate of costs. This is the kind of irrational decisionmaking formal CBA often fosters. Congress rejected formal CBA in § 316(b) for that reason.

ARGUMENT

I. FORMAL CBA, LIKE EPA RELIED ON HERE, IS NOT "COMMON SENSE"; IT IS A SPECIFIC AND CONTROVERSIAL DECISION PROCEDURE THAT CONGRESS PROHIBITED IN THE CWA.

In deciding which of several alternatives to adopt for the Phase II rule—setting the standard under CWA § 316(b) for "minimizing adverse environmental impact" from cooling water intake structures at existing power plants—EPA relied in part on a formal, economic cost-benefit analysis. *See* pp. 28-31, *infra*. By "formal economic cost-benefit analysis" (hereinafter "formal CBA"), we refer to an analysis that estimates a regulation's costs and benefits to society in quantified, monetary terms and then compares them.[2] *See* Economists Frank Ackerman, et al. Amicus Br. 10.

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[2] EPA appears to also contemplate that formal CBA will be used in connection with the site-specific compliance alternative. *See* 67 Fed. Reg. at 17,149 ("EPA believes that a rigorous . . .

This is not, as petitioners contend, simply a "common sense . . . imperative of basic rationality to ensure that actions do more good than harm." Entergy Br. 29. It is a specific and highly controversial decision procedure that Congress considered and rejected in drafting the CWA as a whole, and in § 316(b) in particular. Riverkeeper Br. 6-14, 47-50. Accordingly, the EPA violated § 316(b) by using formal CBA to decide on the Phase II rule, and the judgment of the court of appeals should be affirmed.

II. WHEN THE CWA WAS PASSED, LAWMAKERS WERE HIGHLY SKEPTICAL OF FORMAL CBA.

Congress passed the Clean Water Act in 1972, during a time when many members of Congress viewed formal CBA with considerable skepticism.[3] In negotiations over the wording of § 316(b), the CBA skeptics won out, keeping any provision for formal

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economic analysis should be performed when a facility seeks a site-specific determination of best technology available due to significantly greater cost as compared to the benefits of compliance.").

[3] Congress' skepticism reflected an extensive academic literature critiquing formal CBA. *See, e.g.*, Lawrence H. Tribe, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, 83 Yale L. J. 1315 (1974); C. Edwin Baker, *The Ideology of the Economic Analysis of Law*, 5 Phil. & Pub. Aff. 3 (1975). A robust academic critique of CBA continues to this day. *See, e.g.*, Frank Ackerman & Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* (2004); Sidney A. Shapiro & Robert L. Glicksman, *Risk Regulation at Risk: Restoring a Pragmatic Approach* (2003); Cass R. Sunstein, *Incommensurability and Valuation in Law*, 92 Mich. L. Rev. 779 (1994); Elizabeth Anderson, *Value in Ethics and Economics* (1993).

CBA or cost-benefit balancing of any kind out of that section. Riverkeeper Br. 12-14, 49-50. Indeed, the CBA skeptics were successful in keeping formal CBA out of the statute entirely. *Id.* at 6-12, 48-49. While a few sections of the CWA call for a limited balancing of costs and benefits, *see* pp. 11-12, *supra*, none allow for formal CBA. Riverkeeper Br. at 12.

A. Congress Eschewed Formal CBA in Every Federal Environmental Statute Passed in the Early 1970s.

Indeed, in every major environmental, health, and safety statute passed during the first half of 1970s, Congress eschewed formal CBA. *See* Cass R. Sunstein, *Risk and Reason* 21-22 (2002) ("[M]ost federal statutes do not call for cost-benefit balancing, and many of them seem to preclude it."); *American Textile Mfrs. Inst. Inc. v. Donovan*, 452 U.S. 490, 508-522 (1981) (Occupational Safety and Health Act of 1970 requires feasibility analysis rather than CBA); *Whitman v. American Trucking Ass'ns*, 531 U.S. 457, 467 (2001) (Clean Air Act of 1970 prohibits weighing costs against benefits in promulgation of national ambient air quality standards); *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 173, 184 (1978) (§7 of Endangered Species Act of 1973 prohibits weighing costs against benefits).

Members of Congress were concerned that efforts to quantify and monetize the values associated with human health and the environment would be so controversial and so plagued by uncertainties that agencies would waste valuable time and resources without producing meaningful results. A 1976 House report found these limitations "so severe that they militate against [the] use [of benefit/cost analysis]

altogether." Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, House of Representatives, 94th Cong., *Federal Regulation and Regulatory Reform*, H. Rep. No. 75-931, at 515 (1976). A 1978 Senate study took a similar view:

> Where economic regulation is concerned, [cost-benefit] analysis can be more easily applied, since there the consequences are usually capable of being reduced to dollar and cent terms. Such is not always the case with health, safety and environmental regulation. Here it is extremely difficult to quantify benefits since they are subject to great uncertainty and often become apparent only with the passage of time. In addition, some important benefits—such as recreational or aesthetic values—are difficult if not impossible to quantify in any meaningful way . . . . Therefore there are serious limitations to the use of economic impact analysis in the health and safety area . . . . [D]ecisionmaking to protect the public from serious hazards should not be reduced to those terms.

U.S. Senate Committee on Governmental Affairs, 96th Cong., *Study on Federal Regulation,* S. Doc. No. 96-13, at xxiv (1978). *See also Indus. Union Dep't v. Am. Petroleum Inst.*, 448 U.S. 607, 719 n. 32 (1980) (Marshall, J., dissenting) ("Congress's antipathy toward cost-benefit balancing is evident throughout

the legislative history of the [Occupational Safety and Health] Act.").[4]

Thus, despite petitioners' protestation that Congress "could not possibly have intended" such "absurd" results (Entergy Br. 22), the fact that, in 1972, Congress drafted § 316(b) of the CWA to preclude the use of formal CBA (or indeed any kind of cost-benefit balancing) is not at all surprising.

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[4] In light of Congress' antipathy toward formal CBA, petitioners' suggestion that, unless Congress has explicitly prohibited CBA, "it may be arbitrary and capricious" for an agency *not* to do it, is specious. Entergy Br. 30. The only authority petitioners cite for this proposition is an article by Professor Cass R. Sunstein, *Cost-Benefit Default Principles*, 99 Mich. L. Rev. 1651 (2001), in which he calls on the federal courts to adopt a presumption favoring formal CBA where a statute is silent. *Id.*; *see also* PLF Amicus Br. 5-6 (advocating Sunstein's "default principle"); Entergy Br. 26, n. 8 (same). Here the statute is *not* silent; § 316(b) clearly requires EPA to apply a technology based standard rather than CBA. *See* Riverkeeper Br. 23-33. But even if it were, petitioners' call for the application of a "cost-benefit default principle" would be unavailing. While Professor Sunstein is a widely-respected scholar, as shown above, his proposal is clearly out of step with Congressional intent. This perhaps explains why this Court has repeatedly declined to adopt his default principle. *See Whitman*, 531 U.S. at 467 ("We have . . . refused to find implicit in ambiguous sections of the [Clean Air Act] an authorization to consider costs that has elsewhere, and so often, been expressly granted."); *Donavan*, 452 U.S. at 510 ("When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute."). *See generally* Amy Sinden, *Cass Sunstein's Cost-Benefit Lite: Economics for Liberals*, 29 Col. J. Envtl. L. 191, 228-240 (2004) (critiquing Sunstein's proposal).

B. In Most Environmental Statutes, Congress Directed Agencies to Employ Technology-based Standards, Rather than Formal CBA or Limited Cost-Benefit Balancing.

Rather than directing agencies to engage in formal CBA or even a limited cost-benefit balancing, most environmental statutes of the 1970s, including the CWA, direct agencies to employ technology-based standards. *See, e.g.,* CWA, 33 U.S.C. §§ 1311(b)(2), 1314(b)(2) (effluent limits for point sources based on the "best available technology"); Clean Air Act, 42 U.S.C. § 7411(a)(1) (emissions limits for new sources based on "the best system of emission reduction . . . adequately demonstrated"). Technology-based standard-setting requires the agency to evaluate the likely costs of a proposed standard in order to determine whether it is economically feasible (i.e., "available"). It does not require agencies to delve into the far more problematic task of attempting to quantify and monetize the environmental benefits of regulation in order to compare them to costs. *See* Economists Frank Ackerman, et al. Amicus Br. 16-26.

The technology-based approach was particularly important to Congress' overhaul of the CWA in 1972. Previous versions of the Act had required standard-setting and enforcement to be based on an evaluation of the benefits of regulation—i.e., on assessments of the quality of the receiving waters. *EPA v. California*, 426 U.S. 200, 202-205 (1976). This approach proved to be entirely unworkable—in the words of the Senate Committee on Public Works—"inadequate in every vital aspect." 2 *A Legislative History of the Water Pollution*

Control Act Amendments of 1972, Ser. No. 93-1, at 1423 (1973); S. Rep. No. 92-414, at 7 (1971).

Evaluating the benefits of water pollution reduction was extremely difficult. *California*, 426 U.S. at 202. It required tedious and costly site-specific measurements, as well as assessments of complicated and inadequately understood ecological chains of causation. Technology-based standard setting, on the other hand, allowed EPA to simply set uniform national standards for each industry based on the maximum technologically achievable level of pollution reduction. *Weyerhaeuser v. Costle*, 590 F.2d 1011, 1042 (D.C.Cir. 1978). This only required the agency to evaluate technologies and costs. *See* Economists Frank Ackerman, et al. Amicus Br. 16-26. Thus, one of Congress' primary goals in overhauling the CWA in 1972 was to relieve permitting agencies of the burden of attempting to measure regulatory benefits. *See Ass'n of Pacific Fisheries v. EPA*, 615 F.2d 794, 805 (9th Cir. 1980); Riverkeeper Br. 6-7.

C. In the Few Instances when Congress did Authorize Cost-Benefit Balancing, It Intended a Limited Qualitative Balancing, Not Formal CBA.

Even in the few instances in the early 1970s in which Congress did instruct agencies to compare costs and benefits, it did not expect them to perform a full-fledged, formal CBA. Rather, it directed them simply to perform a rough, qualitative comparison to ensure that costs were not wholly disproportionate to benefits. *See, e.g.,* National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(B) ("insure that presently unquantified environmental . . . values . . . be given appropriate consideration in decisionmaking

along with economic . . . considerations"); NEPA Implementing Regulations, 40 C.F.R. § 1502.23 (NEPA analysis "need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations.").

In the CWA itself, Congress called for a balancing of costs and benefits in conjunction with the Best Practicable Technology standard. In promulgating these interim standards, which were to remain in effect for only a few years, *see* 33 U.S.C. § 1311(b)(1)(A); Riverkeeper Br. 34-35, the statute directed EPA to consider the costs that would be imposed on industry "in relation to the effluent reduction benefits to be achieved." *Id.* at § 1314(b)(1)(B).

Congress did not intend by this language to authorize EPA to engage in formal CBA. This language contemplated no more than a "limited cost-benefit analysis," intended to cull out the most extreme cases where "the additional degree of effluent reduction is wholly out of proportion to the costs." 1 *A Legislative History of the Water Pollution Control Act Amendments of 1972*, Ser. No 93-1, at 170 (1973); *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71, n. 10 (1980)(quoting legislative history); *Weyerhaeuser*, 590 F.2d at 1045 n. 52 (same); *BASF Wyandotte Corp. v. Costle*, 598 F.2d 637, 656-57 (1st Cir. 1979)(CWA imposes obligation on EPA only to perform "limited cost-benefit balancing" which "is a relatively subsidiary task and need not be precise").

Concerned that EPA not be "bog[ged] down in burdensome proceedings" the courts held that "cost need not be balanced against benefits with pinpoint precision." *Weyerhaeuser*, 590 F.2d at 1048. Indeed, EPA was not supposed to monetize the benefits at all. Nor did Congress intend the agency to investigate the

full social benefits of the regulation in the welfare economic sense—that is, to attempt to measure the overall ecological improvement in the quality of the receiving waters. *Pacific Fisheries*, 615 F.2d at 805. Instead, the statute directed EPA to balance only a very simplified version of the benefits: "the effluent reduction benefits," 33 U.S.C. § 1314(b)(1)(B), i.e., the pounds or tons of a pollutant that would be prevented from entering the water. Thus, EPA was simply supposed to hold up the pounds of pollutant reduced next to the dollar costs of the regulation and perform a limited balancing. *Weyerhaeuser*, 590 F.2d at 1047.

D. No Consensus Favors Formal CBA; It has Always been Highly Controversial.

There is *not* a long-standing consensus favoring the use of formal CBA in agency decisionmaking, as petitioners and their amici contend. *See* AEI-Brookings Amicus Br. 8. The widespread use of formal CBA by federal agencies began in 1981, when President Reagan signed Executive Order 12,291, requiring formal CBAs to be prepared for all major federal regulations. 46 Fed. Reg. 13,193 (1981). The executive order was seen at the time as a highly partisan effort to slow regulatory activity. *See* Richard L. Revesz, et al., *Retaking Rationality* 24-29 (2008); *see also* Sunstein, *Risk, supra,* at 20 ("Executive Order 12,291 proved extremely controversial."). Indeed, it explicitly stated that its purpose was "to reduce the burdens of existing and future regulations." 46 Fed. Reg. at 13,193.

The executive order gave authority to oversee agency compliance with the new CBA mandate to the

newly created Office of Information and Regulatory Affairs (OIRA) within the White House Office of Management and Budget. 46 Fed. Reg. at 13,193 (§ 2(b)). This review process, including the relationships and communications between OIRA officials and regulated industries, was "shrouded in secrecy," which only served to heighten the skepticism and suspicion with which many members of Congress and environmental groups viewed OIRA and the CBA mandate. *See* Revesz, *supra,* at 25; *EPA: Investigation of Superfund and Agency Abuses (Part 3): Hearings Before the Subcomm. on Oversight and Investigations of the Comm. on Energy and Commerce*, 98th Cong. 2 (1983) (statement of Rep. John Dingell) ("OMB acts as a conduit for promoting the views of industry affected by proposed regulations through secret, undisclosed, and unreviewable contacts.").

It was widely assumed that OIRA review of regulations under the executive order's CBA mandate would have the effect of delaying and weakening rather than spurring regulation, and that, indeed, has been the effect. *See* David M. Driesen, *Is Cost-Benefit Analysis Neutral?*, 77 U. Colo. L. Rev. 335, 365, 380 (2006) (Of 25 OIRA reviews studied, 24 resulted in changes that weakened environmental, health, and safety protections.).

Although the Clinton administration pulled back from the explicitly anti-regulatory stance of the Reagan and Bush I administrations, it continued to implement the same basic cost-benefit mandate, replacing Reagan's executive order with a similar one that softened a few edges but kept the essential mandate intact. *See* Exec. Order 12,866, 58 Fed. Reg. 51,735 (1993)(replacing Reagan-era requirement that benefits "outweigh" costs with "reasoned

determination" that benefits "justify" costs); OMB, *Circular A-4*, at 10 (Sept. 17, 2003)("A distinctive feature of [CBA] is that both benefits and costs are expressed in monetary units."), *avail. at*: http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf. Despite the embrace of CBA by the Clinton administration, however, debate among scholars and policymakers continued unabated and continues today. *See* p. 5, note 3, *supra*.

III. CONGRESS ESCHEWED FORMAL CBA FOR GOOD REASON: IT PRODUCES UNRELIABLE AND IRRATIONAL RESULTS

Congress had good reason to be skeptical of the use of formal CBA to evaluate environmental health and safety regulation in the 1970s, and those reasons remain valid today. The application of formal CBA to environmental regulation rests on the untenable assumption that the complex ecological and human health processes that such regulation seeks to protect can be quantified and expressed in dollar terms. In practice, scientific understandings are rarely fine-grained enough to predict impacts in quantifiable terms. Even where they are, data are inevitably vastly incomplete. And even for those quantifiable data that do exist, the process of converting such data into dollar terms raises intractable practical and theoretical difficulties that make most monetized estimates of impacts endlessly contestable. As a result, formal CBA fails miserably at its appointed task. Rather than providing a "common sense" tool for insuring "rational" regulation (Entergy Br. 4, 10, 29), formal CBA produces Alice-in-Wonderland results that are so incomplete and so unreliable, they

provide endless opportunity for manipulation, effectively vesting in agency officials virtually unlimited and unreviewable discretion.

Formal CBA need not pinpoint costs or benefits with a single number. Some range of uncertainty is to be expected from any decisionmaking standard. Results could have some margin of error and still be quite useful. But the difficulties inherent in trying to attach a dollar figure to environmental values—like a human life or clean water or a species or an ecosystem—create uncertainties of such enormous magnitude that no meaningful comparison of costs and benefits is possible.

EPA's CBA of its regulation limiting arsenic in drinking water, cited by amicus Pacific Legal Foundation (PLF Amicus Br. 7), provides a telling example. EPA estimated the costs of that rule to be approximately $206 million, *see* 66 Fed. Reg. 6,976, 7,010 (2001), but a study by Professor Cass Sunstein concluded that reasonable people making reasonable assumptions could peg the benefits of the rule anywhere between a low if $13 million or a high of $789 million. *See* Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 Geo. L. J. 2255, 2288 (2002). EPA presented the benefits as falling somewhere within the modest range of $140 to $200 million. 66 Fed. Reg. at 7017. This presented a false and misleading picture that failed to capture the true magnitude of the uncertainties involved. *See* Sinden, *supra*, at 212-29.

A CBA with this level of uncertainty does not help anyone identify "whether the regulation does more harm than good." (Entergy Br. 21). Rather than "rationalizing" agency decision making (*id.*), it makes it more vulnerable to political distortion. When uncertainties are so large, interest groups can easily

manipulate the numbers to reach their desired outcome.

A. The Data and Scientific Understandings Necessary to Quantify Many Environmental and Health Benefits are Simply Unavailable.

In many instances, we lack the data and/or scientific understanding necessary to make definitive, non-controversial estimates of the environmental benefits of regulation. See, e.g., Hon. Stephen Breyer, *Breaking the Vicious Circle* 45 (1993) (attempt to assess risks associated with aflotoxin in peanuts yielded "[t]wo scientifically plausible models . . . show[ing] risk levels differing by a factor of 40,000."). Quantifying the health benefits associated with the arsenic rule, for example, was no easy task. Various studies linked arsenic to seven different types of cancer as well as to other health effects, but only the studies linking arsenic to lung and bladder cancer provided data in quantifiable form. *See* Sunstein, *Arsenic, supra,* at 2272-74. Even for those cancers, there were no hard data at low doses. *Id.* at 2279-82. From the outset, then, even before any attempt at monetization, the benefits estimate for EPA's arsenic CBA contained a large range of uncertainty and covered only a fraction of the relevant health effects.

1. *The CBA of the Phase II Rule was Grossly Incomplete Because EPA did not even Quantify the Vast Majority of the Benefits.*

For rules with primarily ecological benefits, the informational problems are even more acute, because so many aspects of ecological processes are

still so poorly understood. Accordingly, EPA has expressed concern that formal CBAs under the CWA have generally "been limited in the range of benefits assessed," thus "hinder[ing] EPA's ability to compare . . . benefits and costs . . . comprehensively." 67 Fed. Reg. at 17,191. EPA found the process of assessing benefits for the Phase II rule similarly "challenging." 69 Fed. Reg. 41,576, 41,655 (2004). Ultimately, its formal CBA failed to include the vast majority of the rule's benefits.

EPA began by estimating the number of fish impinged or entrained at intake structures. *See* 67 Fed. Reg. at 17,190. These impacts vary widely from site to site, depending on the type of aquatic ecosystem that exists there, the size and location of the intake structure, and so on. *See id.* Accordingly, EPA did a series of case studies of facilities in different regions and on different water body types, and used those results to extrapolate estimates of impingement and entrainment for all the facilities in the country. *See* 69 Fed. Reg. at 41,655.

From the outset, of course, estimating the number of fish impinged or entrained leaves out a whole set of other ecological harms caused by cooling water intake, including the loss of non-fish species and impacts on the functioning of the ecosystem as a whole. *See* EPA, *Regional Analysis Document for the Final Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-003, at A9-1 (February 12, 2004) (available at http://www.epa.gov/waterscience/316b/phase2/casestudy/final.htm). Phytoplankton and zooplankton trapped in cooling water intake structures can also be of crucial importance to the aquatic food chain but these losses were not calculated by EPA. Indeed, EPA did not even include the loss of certain commercially valuable large

invertebrate species like lobsters, mussels, crabs, and shrimp because they lacked adequate data. *See* EPA, *Economic and Benefits Analysis (EBA) for the Proposed Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-001, at C1-7 (February 2002) (available at http://www.epa.gov/waterscience/316b/phase2/econbenefits). Nor did EPA include effects on fish-eating birds or on sea turtles and other endangered species. *See* 69 Fed. Reg. at 41,624 ("3,200 threatened or endangered sea turtles entered enclosed cooling water intake canals at the St. Lucie Nuclear Generating Plant in Florida."). Moreover, the agency made no attempt to account for cumulative impacts, *see* EPA, *EBA Proposed Rule, supra*, at C1-6, or the "stresses to overall communities and ecosystems as evidenced by reductions in diversity or other changes in system structure and function," 69 Fed. Reg. at 41,586. EPA acknowledged that while all of these impacts are very important, measuring them is particularly challenging, because "[p]opulation dynamics and the physical, chemical, and biological processes of ecosystems are extremely complex." *Id.*

2. Even for those Benefits EPA did Attempt to Quantify, the Estimate was Grossly Incomplete.

Even for the narrow slice of benefits that EPA did attempt to quantify, its estimates were highly inaccurate and incomplete, as EPA repeatedly acknowledged.

EPA derived its estimate of the magnitude of impingement and entrainment impacts on fish from facility-reported data. 69 Fed. Reg. at 41,656. This introduced yet another source of uncertainty and

inaccuracy. *See* EPA, *EBA Proposed Rule, supra,* at C1-6. Most facilities had never even conducted such studies. *See* EPA, *Economic and Benefits Analysis (EBA) for the Final Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-04-005, at A2-1 (February 2004) (available at http://www.epa.gov/waterscience/316b/phase2/econbenefits/final.htm). Among those that had, sampling methods and equipment were "highly variable." 69 Fed. Reg. at 41,656. The "data [were] often limited to a subset of species," and were in some instances as much as three decades old. *Id.* EPA observed that as a result of these problems, "the magnitude of impingement and entrainment is often underestimated." 67 Fed. Reg. at 17,190; *see also* EPA, *EBA Proposed Rule, supra,* at C1-6 ("EPA believes that its analysis is likely to lead to potentially significant underestimates . . . of regulatory benefits.").

Once it had estimated the number of fish that are otherwise lost through impingement and entrainment but would be saved by the rule (1.4 billion annually), 69 Fed. Reg. at 41,657, EPA then estimated the number of those fish that would likely be caught by commercial and recreational fishermen. Most fish species are not caught at all. And even among those species that are, harvest rates are usually less than 20 percent. Accordingly, the number of affected fish that EPA actually counted was vanishingly small:

> Of the organisms which are anticipated to be protected by the section 316(b) Phase II rule, it is projected that approximately 1.8 percent will eventually be harvested by commercial and recreational fishers and therefore

> can be valued with direct use valuation techniques. The Agency's direct use valuation does not account for the benefits from the remaining 98.2% of the age 1 equivalent aquatic organisms estimated to be protected nationally under today's rule.

Id. at 41,660-61.

This estimation was, as EPA acknowledged, grossly incomplete, since the fish that survive uncaught have an obvious ecological value. They will reproduce to sustain the population that will be fished on in future years, they will provide food for other fish, and undoubtedly play other important roles in the larger ecosystem as well. *See id.* at 41,657. This methodology generated considerable controversy and illustrates the high degree of indeterminacy that attempts to quantify natural resource values can create. For example, natural resource economist Frank Ackerman, Ph.D., of Tufts University, commented on the proposed rule, criticizing EPA's incomplete accounting of fish mortality. *See* J.A. 211- 244. He argued that a more reasonable methodology that took into account the value of the fish that were not caught would have the effect of doubling EPA's benefits estimate. J.A. 223.

In sum, EPA's benefits estimate was hopelessly incomplete, encompassing only a tiny fraction of the total benefits of the Phase II rule. Many aspects of the rule's benefits were left off the ledger sheet entirely because EPA simply lacked the data necessary to assess them. Even with respect to the benefits for which EPA did have some limited data—avoidance of impingement and entrainment impacts

on fish—EPA's estimate accounted for less than two percent of the impacted fish.

B. Techniques for Assigning Monetary Values to Non-Market Goods are Unreliable and Highly Contestable.

Formal CBA requires the analyst to attach dollar figures to values that have no price—human lives, healthy ecosystems, endangered species. For many, the very thought of attempting to assign a dollar price to such intangibles defies common sense. At a minimum, the practice proves extremely controversial. While economists have developed a number of methods for deriving "shadow prices" for non-market goods, the numbers they produce are inevitably soft and highly contestable.

Often, in order to attach a dollar figure to unpriced natural resources, analysts resort to public opinion polls. In what is called the "contingent valuation method" (CVM), analysts give members of the public information about a particular good—the preservation of an endangered species, or the maintenance of clean air or clean water—and then ask how much they would be willing to pay for it. Thomas H. Stevens, et al., *Measuring the Existence Value of Wildlife: What Do CVM Estimates Really Show?* 67 Land Economics 390 (1991); *see* 67 Fed. Reg. at 17,150 (suggesting use of contingent valuation in CBAs for site-specific BTA determinations). One such survey found the average person willing to pay $19.28 per year to prevent the extinction of bald eagles. *See* Stevens, *supra,* at 396.

Studies like these never produce hard numbers. They are inevitably subject to challenge on a variety of methodological grounds. The survey may

be criticized for the amount or objectivity of the background information provided, the way questions are phrased, the fact that respondents are not subject to actual budget constraints, or the geographic scope of the survey. *See id.* at 396-99. If EPA were to conduct a contingent valuation survey on the endangered sea turtles lost in cooling water intake structures in Florida, for example, would it be appropriate to count the willingness-to-pay of all people in Florida, everyone in the U.S., or everyone in the world? There is no consensus on how to handle such problems, yet outcomes can vary widely—by orders of magnitude—depending on how they are resolved. *See* Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 Mich. L. Rev. 570, 640 (1996). Accordingly, the results of any such study are inevitably vulnerable to reasonable arguments that they should be adjusted significantly up or down. Alternatively, agencies put off by the expense and controversy may forego such studies and simply leave non-market goods out of the calculation altogether.

1. The CBA for the Phase II Rule was Grossly Incomplete Because EPA was Unable to Find Non-Controversial Methods for Monetizing Non-Market Goods.

The vast majority of the benefits associated with the Phase II rule involved ecological values that EPA was simply unable to quantify or monetize. The only aspects of the benefits that directly involved a market good were the commercial fish species that would be saved from impingement and entrainment. EPA estimated this value by simply calculating the market price of the additional commercial fish that

would be caught under the rule. 69 Fed. Reg. at 41,659-60.

To account for the value of the recreationally caught fish, EPA used a "random utility model," which inferred anglers' willingness-to-pay for recreational fishing based on their travel costs for visiting particular fishing sites and then used a mathematical model to estimate how that willingness-to-pay would likely increase in response to increased catch levels. EPA, *Regional Analysis, supra,* at A11-1 to A11-13; 69 Fed. Reg. at 41658-57.

Even putting aside the uncertainties and questionable assumptions associated with EPA's valuation of recreational fishing, the fishing benefits that EPA actually counted represented only a very small slice of the full spectrum of environmental benefits associated with the rule. First, EPA's estimate of commercial and recreational fishing benefits accounted for less than two percent of the total number of aquatic organisms subject to impingement and entrainment. *See* pp. 19-20, *supra.* Second, even had they accounted for one-hundred percent of the fish killed by impingement and entrainment, this would have covered only a very narrow slice of the broad and complex harms caused by cooling water intake structures.

In the documents supporting its CBA, EPA acknowledged this significant limitation in its analysis and itemized the wider ecological harms its CBA omitted. EPA, *Regional Analysis, supra,* at A9-1. The list is too long to reproduce here, but included, for example, the fact that "[f]ish are essential for energy transfer in aquatic food webs, regulation of food web structure, nutrient cycling, maintenance of sediment processes, redistribution of bottom substrates, the regulation of carbon fluxes

from water to the atmosphere, and the maintenance of aquatic biodiversity." *Id.*

EPA had no way of valuing most of these broader ecological impacts, both because they involve processes that are only dimly understood by science, and because they involve goods and services not traded in markets. Accordingly, EPA simply left most of these values off the balance sheet altogether. The agency did, however, make an attempt to include two aspects of these non-market benefits in its quantified estimate: 1) the benefits of increased survival of "forage" species (fish that other species prey on), and 2) non-use benefits of the aquatic ecosystem. As the next two sections explain, however, even these attempts were largely unsuccessful.

a) EPA Used a Method for Estimating the Benefits of Increased Forage Species Survival that Measured "Only a Small Share of these Losses."

EPA initially used one of two methods to attempt to estimate the benefits of increased forage species survival, depending on the region. In most regions, it used "estimates of trophic transfer efficiency to relate foregone forage production to foregone commercial and recreational fishery yields." 67 Fed. Reg. at 17,191. EPA acknowledged that this method was highly incomplete in that it measured "only the small share of these losses, . . . namely the contribution of the forage species to the increased biomass of landed recreational and commercial species." *Id.* at 17,193. As such, this method left out the myriad other ecological functions such species undoubtedly serve.

In a few regions, EPA initially used a Habitat Replacement Cost analysis instead, which used the projected costs of habitat replacement programs for various species suffering impingement and entrainment losses as a proxy for the value of forage species losses. *Id.* at 17,191. EPA viewed this method as considerably more comprehensive, in part because of its "recognition that impingement and entrainment losses have impacts on all components of the aquatic ecosystem . . . beyond that estimated by reduced commercial and recreational fish catches." *Id.* This method also posed problems, however. EPA acknowledged that it did "not take into consideration ecological problems associated with introducing hatchery fish into wild populations." *Id.* And it generated significant controversy. In comments on the proposed rule, natural resource economist, Robert Stavins, Ph.D. of Harvard University, criticized the Habitat Replacement Cost method as "completely illegitimate" and "fatally flawed." J.A. 234.

In the final rule, EPA abandoned the Habitat Replacement Cost analysis altogether. Instead, it used the far lower (and less complete) numbers generated by the trophic transfer model, noting that estimating the value of forage species is "challenging." 69 Fed. Reg. at 41,657; *see* EPA, *Regional Analysis*, *supra*, at A15-1. Ultimately, then, EPA's estimate of the benefits of increased survival of forage species was, by its own admission, significantly incomplete.

b) Although EPA Believed that "Non-Use Benefits may be Significant," It Ultimately Assigned them a Value of Zero.

"Non-use values" are the values people attribute to resources they have no intention of ever using or experiencing directly. These are sometimes referred to as "existence values" or "bequest values." EPA, *Case Study Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule*, EPA-821-R-02-001, at A9-10 (February 2002) (available at http://www.epa.gov/waterscience/316b/phase2/casestudy). Often such values are estimated using contingent valuation studies, which can be quite controversial. *See* pp. 21-22, *supra*. But in this instance, EPA lacked the resources to even conduct such studies. *See* EPA, *Case Study, supra,* at A9-10.

Instead, EPA applied a "rule of thumb" based on a 1977 study, which inferred that non-use values associated with water-quality improvements were typically 50 percent of recreational use values. *See id.* 67 Fed. Reg. at 17,149. As described above, EPA's estimate of recreational use values was itself based on shadow pricing methods that were far from precise. *See id.* at 17,193 ("[N]onuse benefits are most likely understated using the 50 percent rule because the recreational values used are likely to be understated."). Perhaps predictably, then, EPA's 50-percent rule of thumb came under considerable fire during the comment period. Economist Robert Stavins argued that the 50-percent rule was far too high. J.A. 231, 233. Economist Frank Ackerman, on the other hand, argued that it was too low and that based on more recent literature, non-use value should be estimated at two-times use value. J.A. 220.

Ultimately, when it came to the final rule, EPA threw up its hands and attached no monetary value to non-use benefits at all. It explained in the preamble that while there was "evidence that non-use values could occur as a result of this rule, . . . EPA

was unable, by the time of publication . . . to estimate reliable valuations . . . [or] to fully develop and analyze . . . non-use benefit approaches." 69 Fed. Reg. at 41,657; *id.* at 41,666 (EPA believes omitted "non-use benefits may be significant."); *id.* at 41,662 (same).

By EPA's own admission, then, even the CBA that accompanied the proposed rule vastly underestimated the benefits. But by the time it issued the final rule, EPA had backed away from so many of the methods it had originally used to try to value non-market goods that its benefits estimate had shrunk by nearly ten-fold. Thus, while the total benefits estimate for the proposed rule was $735 million, EPA, *EBA Proposed Rule, supra,* at D1-4, the benefits estimate associated with the final rule was just $83 million. 69 Fed. Reg. at 41,666.

C. EPA'S Estimate of Benefits for the Phase II Rule was Grossly Incomplete, Making Any Comparison with Costs Irrational and Misleading.

The story of the Phase II rulemaking provides a helpful illustration of how formal CBA so often produces results that actually serve to undermine "common sense" and "rational" decision making. Entergy Br. 4, 29. EPA's estimate of the benefits of the rule was so hopelessly unreliable and incomplete that any attempt to compare it with the costs was patently irrational. Thus, rather than clarifying the relevant issues and helping to identify "whether the regulation did more harm than good" (*id.* at 21), formal CBA in this instance actually served to obscure relevant issues and mislead decisionmakers.

Even EPA's own estimates of the benefits of its regulation varied wildly—by a factor of nearly ten—between the proposed and final rules. This disparity resulted largely from the fact that the methods for monetizing non-market ecological values are so inadequate and so contestable. In the end, after receiving extensive criticism on its CBA for the proposed rule, EPA threw up its hands and simply left most benefits out of the analysis entirely.

In reporting the costs and benefits of the final rule, EPA flatly acknowledged that its benefits estimate was incomplete, making a meaningful comparison with costs impossible: "EPA notes that these analyses are based on a comparison of a partial measure of benefits with a complete measure of costs; therefore, the results must be interpreted with caution." 69 Fed. Reg. at 41,666; *see* EPA, *EBA Final Rule, supra,* at D1-5 ("A comparison of complete costs and incomplete benefits does not provide an accurate picture of net benefits to society."). But even the far larger estimate of benefits that accompanied the proposed rule was, by EPA's own admission, grossly incomplete. Throughout the preamble to the proposed rule, EPA repeatedly pointed out the weaknesses in its analysis that likely caused it to underestimate benefits.

1. OIRA Pressured EPA into Weakening its Proposed Rule on the Basis of the Highly Flawed, Incomplete, and Irrational Results of its CBA.

Nonetheless, it appears to have been on the basis of this highly flawed, incomplete, and irrational CBA that OIRA pressured EPA into changing its proposed rule. EPA's originally proposed rule

identified closed cycle cooling as the best technology available for the 59 largest and most environmentally damaging facilities of the 539 subject to the rule. EPA, *OMB Review Draft for the Proposed Section 316(b) Rule for Large Cooling Water Intake Structures at Existing Power Generating Facilities*, Docket W-00-32, DCN # 4-4005, p. 72 (Dec. 28, 2001). These were facilities that either were "located on a tidal river or an estuary" and had "an intake flow that exceeds one percent of the tidal excursion" or were "located on an ocean" and had "an intake flow that exceeds 500 [million gallons per day]." *Id.*

EPA based this proposal on its findings that closed-cycle cooling "is the most effective technology for reducing both entrainment and impingement," *id.* at 75, that closed-cycle cooling is "commercially available and economically achievable" and already in use at 21 percent of existing facilities, *id* at 74-75, and that "facilities can and have installed these technologies years after the facility began operation," *id* at 75. Additionally, EPA found that "the compliance costs for [this proposal] would . . . be low compared to firm-level revenues." *See* 67 Fed. Reg. at 17,158 (82% of firms would incur compliance costs of less than 0.5 % of revenues). Accordingly, this proposal met the "best available technology" test of section 316(b) with flying colors. *See* Economists Frank Ackerman, et al. Amicus Br. 16-23.

When it came to formal CBA, on the other hand, EPA was prescient. Anticipating the conclusion it would ultimately reach two-and-a-half years later after completion of the final rule, the agency stated that "EPA cannot perform a complete benefit-cost comparison because not all of the benefits resulting from the proposed regulatory alternative can be valued in dollar terms." EPA, *OMB Review*

Draft, supra, at 211. At this stage, EPA's formal CBA was not nearly complete: In many places the draft contained "X's" in lieu of numbers that were to be filled in later. *Id.* at 205, 211-12. But EPA could tell, even then, that the analysis would not ultimately be able to quantify enough aspects of the benefits of the proposed rule to provide a rational comparison with costs.

On December 28, 2001, after years spent researching and preparing the proposed rule, EPA submitted it to OIRA for review. 67 Fed. Reg. at 17,208. The rule that emerged 60 days later was drastically changed. The OIRA review process resulted in 58 "major changes" to the rule, including the removal of the closed cycle cooling requirement for the 59 most damaging facilities and the addition of a provision allowing a site-specific determination of permit requirements based on a cost-benefit analysis. See EPA, *Summary of Major Changes During Interagency Review*, Docket W-00-32, DCN # 4-4005, at 1 (2002).

Although records of the communications between EPA and OMB during the review process have not been made public, we can surmise the rationale for the change by comparing the preamble to the proposed rule that was ultimately published in the Federal Register with the preliminary draft EPA submitted to OIRA. In the proposed rule, the closed cycle cooling requirement was demoted from the preferred option to an alternative option. 67 Fed. Reg. at 17,156-58. In describing this option in the preamble to the proposed rule, EPA reiterated all the reasons it would be a good option, including its economic practicality. *Id.* at 17,158. The only rationale EPA offered for why this option might ultimately be rejected was formal CBA. "EPA notes

that the incremental costs of this option relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." *Id.* We can only surmise that this was the rationale OIRA used to push EPA to change the rule, since OIRA's mandate, after all, is to ensure implementation of the mandate for formal CBA in Executive Order 12,866. *See* pp. 12-14, *supra.*

2. Although EPA Cited Its Formal CBA as the Basis for Rejecting the Closed Cycle Alternative, the Proposed Rule Preamble went on to Cite Dozens of Reasons the Benefits were Under-Estimated.

Thus, the EPA rejected the more stringent closed cycle alternative on the grounds that its formal CBA showed the marginal costs of that alternative outweighing its marginal benefits. 67 Fed. Reg. at 17,158. Nonetheless, the remainder of the preamble to the proposed rule went on to systematically undermine that conclusion by repeatedly citing the myriad reasons EPA believed its analysis had under-estimated the real magnitude of the rule's benefits. *See, e.g., id.* at 17,194-96 (repeatedly noting "several critical caveats and limitations of the analysis"). The preamble is peppered with literally dozens of such disclaimers. *See, e.g., id.* at 17,190 ("the magnitude of impingement and entrainment is often underestimated."); *id.* at 17,192 ("Secondary impacts . . . [like] effects on marinas, bait sales, property values, and so forth are not included, even though they may be significant."); *id.* ("Current fishing mortality rates (and resulting estimates of yield) often reflect depleted fisheries, not what the fisheries should or could be if not adversely impacted by

impingement and entrainment and other stressors."); *id.* at 17,193 ("Forage losses are often valued at only a fraction of their potential full value."); *id.* ("Impacts on threatened and endangered species are not fully captured.").

Indeed, references to the benefits being "underestimated" or "understated" appear 23 times in the preamble. *See id.* at 17,190-203. Nowhere does it state that the benefits have been either overstated or overestimated. At one point, EPA entertained that possibility, *see id.* at 17,192 ("the Agency's benefits estimates could be either over- or under-estimated"), but then quickly dismissed it:

> However, because of the many factors omitted from the analysis (typically because of data limitations) and the manner in which several key uncertainties were addressed, EPA believes that its analysis is likely to lead to a potentially significant underestimate of baseline losses and, therefore lead to understated estimates of regulatory benefits.

Id.

Natural resources economist Frank Ackerman, Ph.D., in comments submitted on the proposed rule, suggested that even just correcting for a few of the many inaccuracies in EPA's benefits estimate would yield an estimate 4-6 times as high. J.A. 223. If that were true, then the abandoned closed cycle option would probably actually pass an incremental cost-benefit test. *See* 67 Fed. Reg. at 17,158.

3. The Phase II Rulemaking Illustrates How CBA Undermines Rational Agency Decisionmaking.

The story of the Phase II CBA illustrates why formal CBA so often leads to irrational results that defy common sense and actually obscure the factors relevant to discerning whether a regulation does more harm than good. The benefits estimate for the Phase II rulemaking never produced anything even approaching a reliable or meaningful number. Indeed, the numerical estimate jumped wildly between the proposed and final rules, changing by nearly a factor of ten, from $735 million under the proposed rule to $83 million under the final rule. *See* p. 27, *supra*.

Even the larger number was, by EPA's own frequent admission, grossly and hopelessly incomplete. The documents describing the CBA were peppered with caveats and disclaimers, describing the myriad reasons why the benefits figure grossly underestimated the true benefits of the rule.

Yet, despite the innumerable caveats, EPA still resorted to the raw numbers when it came time to make a decision. It rejected the closed cycle cooling alternative because "the incremental costs of this option relative to the proposed option ($413 million) significantly outweigh the incremental benefits ($146 million)." 67 Fed. Reg. at 17,158. This time there were no caveats or disclaimers.

This is not an unusual story. One of the problems with formal CBA is that, no matter how many narrative explanations, caveats and qualitative descriptions are included in the analysis, regulators face an irresistible temptation to reduce formal CBA to its raw numbers. In this way, they can make

decisions look easy and definitive rather than difficult and ambiguous. *See* Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. Penn. L. Rev. 1553, 1579-80 (2002) (unquantifiable benefits often given lip service in CBA but ultimately ignored; citing arsenic CBA as example where "[s]ubsequent public discussion [of the CBA] inevitably referred only to the EPA's numerical analysis and forgot about the cases of avoided illness that could not be quantified"); Richard Parker, *Grading the Government*, 70 U. Chi. L. Rev. 1345, 1348-49, 1404-06 (2003) (observing increasingly prevalent phenomenon of "regulatory score cards," which "reduce . . . hundreds of pages [in a CBA] to a few summary statistics").

But, as the Phase II rule illustrates, when monetary estimates of benefits and costs are grossly incomplete and highly contestable, as they so often are, attempting to compare them "does not provide an accurate picture of net benefits to society." EPA, *EBA Final Rule, supra,* at D1-5. On the contrary, it leads to irrational results that actually obscure the relevant issues behind a false veneer of scientific objectivity and accuracy. In this way CBA actually reduces the transparency and rationality of government decisionmaking.

Rather than rationalizing and disciplining agency decision making, formal CBA actually renders agency decision making more vulnerable to interest group pressure. Because the numbers it produces are so unreliable and contestable, an interest group unhappy with the result can almost always find an economist who can make a credible argument for the opposite outcome. Indeed, Professor Cass Sunstein

made this observation in connection with his careful analysis of EPA's formal CBA of the arsenic rule:

> We are now in a position to see the multiple possible challenges to any agency decision that involves cost-benefit balancing .... We can see how creative citizens and lawyers, representing water systems or environmentalists, might be able to mount reasonable challenges to EPA's decisions, regardless (almost) of the content of those decisions.

Sunstein, *Risk, supra,* at 179. Thus, rulemaking devolves into a contest over which interest group has the resources to hire the best credentialed economists rather than which side has the better argument.

In sum, formal CBA often undermines rational agency decisionmaking. That occurred in this case, when EPA, at OIRA's urging, rejected the closed cycle alternative on the grounds of a comparison of the raw numbers produced by its formal CBA. EPA compared a monetary estimate of benefits that was hopelessly unreliable and incomplete to a relatively compete estimate of costs and used the results of this fuzzy math to justify its decision.

CONCLUSION

Formal CBA of the type used by EPA in this case undermines rational decisionmaking because it inevitably produces incomplete, unreliable, and contestable results. It requires analysts to attach a dollar figure to values like human lives, healthy ecosystems, and endangered species that cannot be

meaningfully or reliably quantified and monetized. Formal CBA is not a common sense tool for rational decision making, but a very specific and highly controversial method for evaluating regulations. Congress had good reason to prohibit its use under the CWA in general and under § 316(b) in particular.

Respectfully submitted.

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